Al-Adwaa Model 1

1 A. Complete the following sentences:

1. The .... is the reaction between an acid and an alkali to form salt and water.
2. The .... is used to measure the electromotive force of a battery and its unit is known as ....
3. The trait that appears in all individuals of the first generation in Mendel's experiments is known as .... trait.
4. The glucagon hormone is secreted from the ....
5. On heating copper sulphate, ... gas evolves.

B. What happens when/ in case of ...?

1. Heating an amount of red mercuric oxide.
2. The deficiency of growth hormone secretion in childhood.

C. Mention one use for each of the following:

1. The sliding rheostat.
2. Radioactive elements in medicine.

2 A. Write the scientific term for each of the following:

1. The changing in the concentration of the reactants and the products per unit of time.
2. The substance which loses one electron or more during the chemical reaction.
3. Chemical messages that control and regulate the function of most of the body organs.
4. The individual who carries a similar pair of genes either dominant or recessive.

B. Calculate the current intensity passing through a cross-section of a conductor due to the flow of 300 coulombs for half a minute.

C. Define:

1. The electric current.
2. The acquired traits.

3 **A. Choose the correct answer:**

1. At the beginning of the chemical reaction, the percentage of the reactants concentration equals ....

   a. 100% b. 0% c. 50% d. no correct answer

2. The hormone which stimulates the body organs to respond to emergencies is called ....

   a. insulin b. glucagon c. estrogen d. adrenalin

3. To generate an alternating electric current, we use the ....

   a. rheostat b. dynamo c. ammeter d. ohmmeter

B. By the balanced symbolic equations, illustrate the following:

1. Reaction between water and sodium.
2. Reduction of hot copper oxide by passing hydrogen on it.

4 **A. Correct the underlined words:**

1. The hormone that is responsible for the appearance of secondary sexual male characteristic is <u>progesterone</u>.
2. Sodium nitrate decomposes by heating into sodium nitrite and <u>nitrogen</u> gas evolves.

B. Give a reason for each of the following:

1. Radiation has genetic effects.
2. Iodine salt is preferred than the normal salt.

C. By using the symbols (Y, y), illustrate the results of crossing between two hybrid yellow seed pea plants showing the parents, the gametes and the resulted generation.

Al-Adwaa Model 2

1 A. Write the scientific term for each of the following:

1. The state of an electric conductor that shows the transfer of the electricity from or to it, when it is connected to another conductor.
2. Traits are not transmitted from one generation to another.
3. DNA parts that are present on the chromosomes that carry the hereditary traits of the body.
4. The changes that appear on a living organism as a result of exposure to radiation.

B. What happens when...?

1. Adding silver nitrate solution to sodium chloride solution.
2. A man takes a little amount of iodine in his food.

C. A student put an amount of sodium hydroxide solution in a test tube and added an amount of hydrochloric acid.

1. Write the balanced symbolic reaction equation.
2. Mention the type of chemical reaction.

2 A. Put (✓) in front of the right statement and (✗) in front of the wrong one:

1. Electrochemical cells convert the chemical energy to electric energy. (   )
2. The cosmic radiation is considered one of the sources of radioactive pollution. (   )
3. The resistance of a conductor which allows the passing of an electric current whose intensity is one ampere and the potential difference between its two terminals is one volt equals one coulomb. (   )
4. The removal of the stamens of a pea plant prevents the cross pollination. (   )

B. Compare between:

- The dominant trait and the recessive trait.

C. If a quantity of electricity of 5400 coulombs passes through a cross-section of a conductor of 30 Ohm resistance for 5 minutes, calculate the potential difference between the two ends of the conductor.

3 A. Complete the following sentences:

1. Decrease of secretion in the .... hormone at the childhood causes dwarfism.
2. The .... is used to measure the electric potential difference between two poles of a conductor in a closed electric circuit.
3. Despite the numerous different traits of the pea plant, Mendel chose .... main traits to conduct his experiments.

B. Give a reason for each of the following:

1. The resistance of the sliding rheostat could be changed.
2. The pituitary gland is called the master endocrine gland or the main gland.

C. A student used 5 grams of manganese dioxide during the hydrogen peroxide decomposition.

1. Mention why.
2. What is the mass of manganese dioxide in the end of the reaction?

4 A. Choose the correct answer:

1. On crossing male and female their genotype (Bb), the genotype (BB) is produced in their offspring by a ratio of ....

   a. 25% b. 50% c. 75% d. 100%

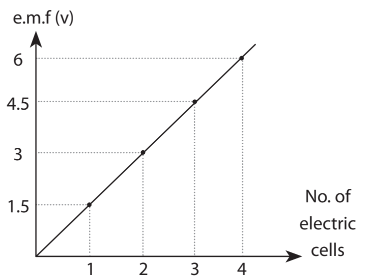
2. The hormone which controls the calcium levels in the blood is ....

   a. calcitonin b. thyroxin c. insulin d. adrenalin

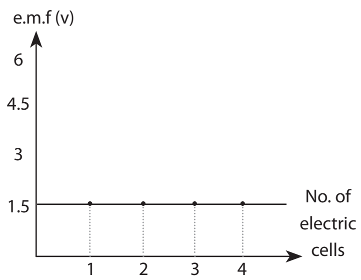
B. Mention one use for each of the following:

1. Catalytic converter.
2. Calcitonin hormone.

C. The two following figures represent the graphical relation between the number of electric cells and the electromotive force (e.m.f.) when they are connected by two different methods to form an electric battery.



(1)



(2)

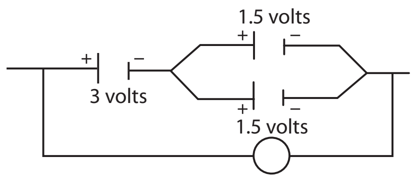
1. Mention the type of connection in each figure.
2. Find the total e.m.f. in each case on connecting the four cells together.

Al-Adwaa Model 3

1 A. Complete the following sentences:

1. Sodium nitrates decompose by heat into sodium nitrite and ....
2. The measuring unit of the electric current intensity is ....
3. Every gene gives a special .... which is responsible for the occurrence of a chemical reaction resulting in .... showing a specific hereditary trait.
4. Increasing of growth hormone secretion in the childhood stage causes ....

B. In the opposite figure:



Calculate the e.m.f. of the battery.

C. What is meant by each of the following ...?

1. Double substitution reaction.
2. The electric potential difference.

2 A. Choose the correct answer:

1. The substance that changes the rate of the reaction without being changed is known as ....
   a. oxidizing agent b. reducing agent
   c. active agent d. catalyst
2. When sodium chloride solution reacts with silver nitrate solution, a .... precipitate is formed.
   a. red b. white c. reddish brown d. blue
3. The scientist who discovered radioactivity phenomenon is ....
   a. Ohm b. Becquerel c. Ampere d. Mendel
4. In dry cell, ... energy is converted into electrical energy.
   a. magnetic b. kinetic c. chemical d. light
5. Among the dominant traits in the human beings is ....
   a. smooth hair b. wide eyes
   c. having no dimples d. presence of freckles

B. Complete the following chemical equations:

1. $CuSO_4 \xrightarrow{\Delta}$ .... + ...

2. $2Al + 6HCl \longrightarrow 2AlCl_3$ + ...

C. Mention one use for each of the following:

1. Ohmmeter.

2. Progesterone hormone.

3 **A. Give a reason for each of the following:**

1. Mendel covered the stigma of pea plant flowers during the study of the seed color.

2. Uranium is considered one of radioactive elements.

3. A red precipitate is formed on adding magnesium to copper sulphate solution.

B. Correct the underlined words:

1. Most of metals carbonates are decomposed into <u>metal</u> and carbon dioxide.

2. Electric current intensity is <u>inversely</u> proportional with potential difference at constant temperature.

C. What happens when ...?

1. Two conductors with the same electric potential are connected by a wire.

2. Pancreas decreases its secretion of the insulin hormone.

4 **A. Write the scientific term for each of the following:**

1. The process of breaking down the bonds between the molecules of reactants and formation of new bonds between the molecules of the products.

2. The substance that gives oxygen and takes hydrogen.

3. The flow of the electric charges through a conductor.

B. Calculate the quantity of electricity flowing through a conductor whose resistance equals 1100 ohms for two minutes, and the electric potential of the electric source is 110 volts.

C. Compare Between:

- Simple goiter and exophthalmic goiter related to its reasons.

Al-Adwaa Model 4

1 A. Complete the following sentences:

1. The electric current intensity which passes through a conductor is measured in .... unit while the potential difference is measured in .... unit.
2. When the amount of iodine decreases in food, the secretion of the .... hormone decreases from .... gland.
3. $Na_2CO_3 + 2HCl \longrightarrow$ .... + H_2O + ...

B. Give a reason for each of the following:

1. The steel scourer used in cleaning aluminium burns faster in a cylinder full of oxygen than its burning in air.
2. The limbs bones of some people grow continuously, so they become giants.

C. If the work done to transfer 100 coulombs through a conductor is 300 joules and the electric current intensity passing through it is 2 amperes, calculate the resistance.

2 A. Choose the correct answer:

1. In the reaction of hydrogen with the black copper oxide, ... takes place in copper oxide.
   a. oxidation   b. reduction
   c. oxidation and reduction   d. no correct answer
2. The two factors of hereditary traits are similar in the .... individual.
   a. pure   b. hybrid   c. recessive   d. (a) and (c)
3. The hormone that stimulates the storage of glucose sugar in liver is the .... hormone.
   a. insulin   b. glucagon   c. growth   d. estrogen
4. Among the dominant traits in the human beings are all of the following except ....
   a. the curly hair   b. the freckles
   c. the wide eyes   d. the ability to roll the tongue

B. Compare between:

- The alternating electric current - the direct electric current in terms of:

  intensity and direction - conversion from one to another.

C. You have four electric cells each of e.m.f. 1.2 volts. **Show by drawing**:

the method of connecting them to obtain a battery of e.m.f. 2.4 volts.

(by two different methods.)

3 **A. Write the scientific term for each of the following:**

1. The trait that disappears completely in the individuals of first generation.
2. The obstruction that faces the electric current during its flow in the conductor.
3. The spontaneous decaying of atoms of some elements present in nature to reach more stability.
4. They are chemical substances produced by the body of living organisms that act as catalysts that increase the speed of biological reactions.

B. When pollinating a tall stem pea plant with a short stem pea plant, they produce individuals of 50% tall stem and 50% short stem: show on heredity bases the gene structure for the parents and produced individuals.

(T for the dominant gene and t for the recessive gene)

4 **A. Correct the underlined words:**

1. In <u>positive</u> catalysts reactions, the catalyst is used to slow down the chemical reaction.
2. The reaction of hydrochloric acid with the iron filings is faster than the piece of iron equal to it in the mass for <u>increasing concentration</u>.

B. What happens when ...?

1. Increasing the wire length of the sliding rheostat in the circuit.
2. Heating of sodium nitrate.
3. The level of sugar in the blood if the pancreas stops secreting the glucagon hormone.

Al-Adwaa Model 5

1 A. Complete the following sentences:

1. The .... apparatus is used to measure the current intensity, while the .... apparatus is used to measure the potential difference.
2. The ionic compounds are found in their solutions in the form of ...., while the covalent compounds are found in their solutions in the form of ....
3. The chromosome chemically consists of a nucleic acid called .... combined with ....
4. When the amount of iodine decreases in the food, the secretion of the .... hormone decreases from .... gland.
5. The radioactive phenomenon was discovered by the scientist ...., where he discovered the emission of unseen rays from the .... element.

B. Give a reason for each of the following:

1. Learning to walk in childhood is not considered a genetic trait.
2. Mendel covered the stigmas of the pistils of pea flowers during studying its seed color trait.

C. If the potential difference between two points is 100 volts, calculate the work done to transfer 25 coulombs between the two points.

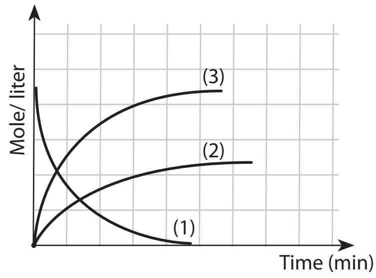
2 A. Write the scientific term for each of the following:

1. The quantity of electricity flowing through a cross-section of the conductor in one second.
2. Enzyme found in sweet potato that accelerates the decomposition process of hydrogen peroxide.
3. Breaking up of bonds in molecules of the reactants and formation of new bonds in the molecules of resultants from the reaction.
4. The arrangement of metals in descending order according to the degree of their chemical activity.

B. Compare between:

1. Direct current and alternating current [according to uses].
2. Dwarfism and gigantism [according to the cause of the injury].

C. The opposite graph clarifies the thermal decomposition of red mercuric oxide:



1. Write the balanced chemical equation that illustrates the reaction.
2. Replace the numbers of the graph with the suitable compound from the equation and give a reason.

3 A. Choose the correct answer:

1. The two factors of hereditary traits are similar in the .... individual.
   a. pure b. hybrid c. recessive d. (a) & (c)
2. Among the factors that affect the speed of chemical reaction is/are ....
   a. the concentration of the reactants b. the nature of the reactants
   c. the temperature d. all the previous answers
3. The value of resistance of an electric conductor in electric circuit is changed by changing the ....
   a. electric current intensity b. potential difference
   c. dimensions of the conductor d. quantity of electricity

4- When heating copper hydroxide, it decomposes into ....
   a. copper oxide and hydrogen b. copper oxide and water vapor
   c. copper and oxygen d. hydrogen and oxygen

B. What happens when ...?

1. Pollination of peas flowers of hybrid yellow seeds with each other.
2. Increasing the time of flowing of electric charges to the double with fixed quantity of charge according to the current intensity.
3. The glucose sugar level in blood is lower than the normal level.

4 A. Correct the underlined words:

1. In the dry cells, the <u>magnetic</u> energy is changed into electric energy.
2. According to the second law of Mendel, the recessive traits appear in the second generation by ratio <u>50</u>%.
3. The <u>progesterone</u> hormone is responsible for the appearance of female secondary sex characters.

B. Illustrate by balanced chemical equations only what would happen when:

1. Passing hydrogen gas over hot copper oxide.
2. Reaction of diluted hydrochloric acid with aluminium turnings.
3. The thermal decomposition of sodium nitrate.

C. You have three similar electric cells the e.m.f. of each is 1.5 volts. Explain with drawing how you can connect them to obtain a battery of e.m.f. of:

1. 4.5 volts. 2. 3 volts.

Model Answers 1

1 **A.** 1. Neutralization reaction

2. voltmeter-volt
3. dominant
4. pancreas gland
5. sulphur trioxide

B. 1. Red mercuric oxide decomposes by heat into mercury (silvery precipitate) and oxygen gas evolves.

2. The body stops growing, so the person becomes a dwarf.

C. 1. It is used to control the current intensity and potential difference in the electric circuit.

2. To treat and diagnose diseases like cancer.

2 **A.** 1. the speed of chemical reaction

2. reducing agent
3. hormones
4. pure individual

B. The current intensity $= \frac{Q}{t} = \frac{300}{30} = 10$ amperes.

C. 1. It is the flow of electric negative charges through a conductor.

2. They are the traits that are not transmitted from one generation to another.

3 **A.** 1. a 2.d 3.b

B.

1. $2Na + 2\,H_2O \longrightarrow 2NaOH + H_2\uparrow$

2. $CuO + H_2 \xrightarrow{\Delta} Cu + H_2O$

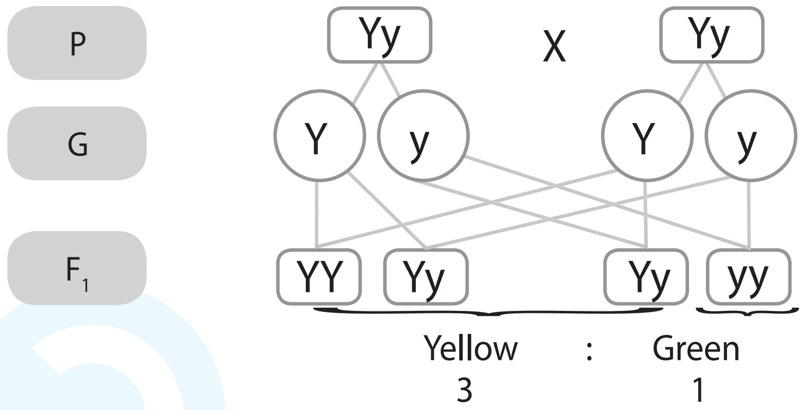
4 **A.** 1. testosterone

2. oxygen

B. 1. Because radiation causes changes in the sex chromosomes composition for living organisms.

2. Because iodine salt is rich in iodine element that enters in the thyroxin hormone's structure.

C.



Model Answers 2

1 **A.** 1. Electric potential of a conductor.

2. Acquired traits.

3. Genes

4. Physical effects

B. 1. Silver nitrate solution reacts with sodium chloride solution to give sodium nitrate and a white precipitate of silver chloride.

2. This leads to decreasing in the secretion of thyroxin hormone which causes the human to suffer from simple goiter.

C. 1. $NaOH + HCl \longrightarrow NaCl + H_2O$

2. Double substitution (neutralization reaction).

2 **A.** 1. (✓). 2. (✓). 3. (✗). 4. (✗).

B.

P.O.C	Dominant trait	Recessive trait
Definition	The trait that appears in all individuals of the first generation.	The trait that disappears completely in the individuals of the first generation.
State	Pure or hybrid (impure)	Always pure
Percentage of appearance	100% in the first generation 75% in the second generation	0% in the first generation 25% in the second generation
Example	**Yellow seed color in a pea plant**	**Green seed color in a pea plant**

C. The potential difference $= R \times I = R \times (\frac{Q}{t}) = 30 \times \frac{5400}{5 \times 60} = 540$ volts

3 **A.** 1. growth

2. voltmeter

3. seven

B. 1. To control the current intensity and the potential difference in the different parts of the circuit.

2. Because it secretes hormones that regulate the activities of most of other endocrine glands.

C. 1. To be used as a catalyst to speed up the rate of reaction.

2. 5 grams.

4 **A.** 1. a 2. a

B. 1. It helps in the treatment of harmful gases emitted from the car engine.

2. It controls the level of calcium in blood.

C. 1. Figure (1): series connection

Figure (2): parallel connection

2. Total e.m.f. in figure (1) = 6 volts.

Total e.m.f. in figure (2) = 1.5 volts.

Model Answers 3

1 **A.** 1. oxygen gas

2. ampere

3. enzyme - specific protein

4. gigantism

B. Total e.m.f. = 4.5 volts

C. 1. They are the reactions in which double substitution (exchange) occurs between the ions of two compounds to give two others new compounds.

2. It is the value of the work done to transfer a quantity of charges of one coulomb between the two ends of this conductor.

2 **A.** 1. d 2. b 3. b 4. c 5. b

B.

1. $CuSO_4 \xrightarrow{\Delta} CuO + SO_3\uparrow$

2. $2Al + 6HCl \longrightarrow 2AlCl_3 + 3H_2\uparrow$

C. 1. It is used for measuring the electric resistance.

2. It promotes the growth of endometrium.

3 **A.** 1. To prevent cross pollination with another flower.

2. Because its nucleus contains a number of neutrons more than the number required for its stability.

3. Because magnesium replaces copper as it comes before copper in the chemical activity series and copper precipitates as a reddish-brown ppt.

B. 1. metal oxide 2. directly

C. 1. No electric current will pass through them, because there is no potential difference between them.

2. The level of glucose sugar in blood increases or human will suffer from diabetes disease.

4 **A.** 1. chemical reaction.

2. oxidizing agent.

3. electric current.

B. Quantity of electricity $= \frac{V}{R} \times t = \frac{110}{1100} \times 120 = 12$ coulombs

C.
- Simple goiter: The decrease in secretion of thyroxin hormone due to the lack of iodine from food as it enters in the hormone's structure.
- Exophthalmic goiter: The increase in the secretion of thyroxin hormone in large amount.

Model Answers 4

1 **A.** 1. ampere – volt

2. thyroxin – thyroid

3. $Na_2CO_3 + 2HCl \longrightarrow 2NaCl + H_2O + CO_2$

B. 1. Because the concentration of oxygen inside the jar is more than that in air, so the number of collisions between molecules increases and consequently the speed of the reaction increases.

3. Due to the increase in the secretion of the growth hormone in childhood.

C. • The potential difference (V) = $\frac{W}{Q} = \frac{300}{100}$ = 3 volts.

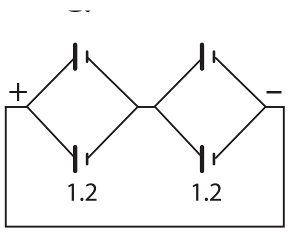
• The resistance = $\frac{V}{I} = \frac{3}{2}$ = 1.5 ohm

2 **A.** 1. b   2. d   3. a   4. b

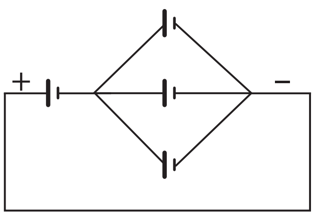
B.

Alternating current	Direct current
- Variable in intensity and direction. - Can be converted into a direct current.	- Constant in intensity and direction. - Cannot be converted into an alternating current.

C.



2.4 volts



2.4 volts

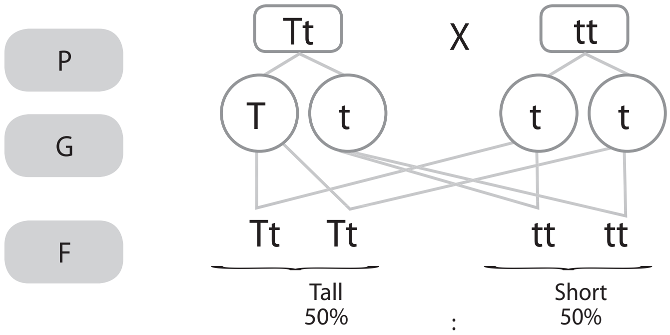
3 **A.** 1. recessive trait

2. electric resistance

3. natural radioactivity

4. enzyme

B.



4 **A.** 1. negative.

2. increasing surface area.

B. 1. The resistance increases and the current intensity decreases.

2. White sodium nitrate decomposes by heat into sodium nitrite (yellowish white) and oxygen gas evolves.

3. The level of glucose sugar in blood decreases.

Model Answers 5

1 **A.** 1. ammeter - voltmeter

2. ions - molecules

3. DNA - protein

4. thyroxin - thyroid

5. Henri Becquerel - uranium

B. 1. Because it's an acquired trait that can't be inherited from one generation to another.

2. To prevent cross pollination with another flower.

C. The work done = potential difference x quantity of electricity = 100 x 25 = 2500 joules

2 **A.** 1. current intensity

2. oxidase enzyme

3. chemical reaction

4. chemical activity series

B. 1. • Direct current: It is used in electroplating processes and in operating some electric appliances.

• Alternating current: It is used in lighting houses and in operating electric appliances.

2. • Dwarfism: It is caused due to the decrease in the secretion of growth hormone in childhood.

• Gigantism: It is caused due to the increase in the secretion of growth hormone in childhood.

C.

1. $2HgO \xrightarrow{\Delta} 2Hg + O_2$

2. (1) Mercuric oxide

   (2) Oxygen gas

   (3) Mercury

3 **A.** 1. d 2. d 3. c 4. b

B. 1. The produced plant will have yellow seeds and green seeds at ratio 3: 1.

2. Electric current intensity decreases to half.

3. Pancreas responds by secreting glucagon hormone to raise the percentage of glucose sugar in blood.

4 **A.** 1. Chemical 2. 25%

3. Estrogen

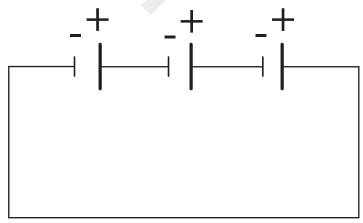
B.

1. $H_2 + CuO \xrightarrow{\Delta} Cu + H_2O\uparrow$

2. $2Al + 6HCl \longrightarrow 2AlCl_3 + 3H_2\uparrow$

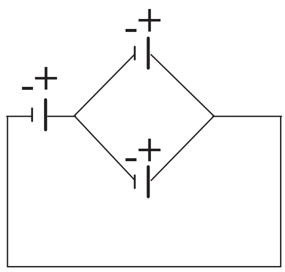
3. $2NaNo_3 \xrightarrow{\Delta} 2NaNo_2 + O_2\uparrow$

C. 1.



4.5 Volts

2.



3 Volts